Parallel Processing of Digital Watermarking Operations

Abstract of the Disclosure

The disclosure describes a method of segmenting a media signal for parallel watermarking operations. The method sub-divides the media signal into segments,

5   distributes the segments to parallel processors, and performs parallel digital watermark operations on the segments in the parallel processors. These parallel processors may comprise separate threads of execution on a processing unit, or several execution threads distributed to several processing units. In one enhancement, the method prioritizes the segments for watermarking operations. This enables finite processing

10   resources to be allocated to segments in order of their priority. Further, processing resources are devoted to segments where the digital watermark is more likely to be imperceptible and/or readable. The disclosure also describes a system for distributed watermark embedding operations including a watermark signal generator, a perceptual analyzer and a watermark applicator. These components are implemented as modules

15   that can operate independently in a distributed processing environment. To further enhance parallelism, the system segments a host media signal into segments for parallel processing on these modules. As such, the system supports operation-level parallelism in the concurrent operation of watermark embedder modules, and data parallelism in the concurrent operation of these modules on segments of a media signal to be

20   embedded with an imperceptible digital watermark.